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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,091	10/10/2001	Shih-Che Lo	LO=16	5662

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EXAMINER

AGUSTIN, PETER VINCENT

ART UNIT	PAPER NUMBER
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2652

DATE MAILED: 01/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/973,091

Applicant(s)

LO ET AL.

Examiner

Peter Vincent M Agustin

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/10/2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

Page 1, line 6: Delete "and" before "etc".

Page 7, line 20: chemical symbol Te has been described in parentheses as Technetium; applicant should either change "Te" to --Tc-- or "Technetium" to --Tellurium--.

2. Claim 8 objected to because of the following informality: Chemical symbol Te has been described in parentheses as Technetium. It is well known in the art that Te is the chemical symbol for the element Tellurium. The chemical symbol for the element Technetium is Tc, as known in the art. Applicant is required to specify the material of which the mask layer of claim 8 is made.

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Drawings

4. The drawings are objected to because of the following informalities: On figure 2, change "36" to --46-- and "34" to --44-- to match specification.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 4, 5 & 6 rejected under 35 U.S.C. 102(b) as being anticipated by Mamin et al. (hereafter Mamin) (US 6,055,220).

In regard to claim 1, Mamin discloses a near-field optical flying head (figure 2, element 22) for near-field recording on a disk (figure 2, element 12), comprising: a carrier (figure 2, element 100) maintained in a near-field distance from the surface of the disk to be recorded; a solid immersion lens (figure 2, element 102) of semispherical shape (figure 3, element 103) installed in one side of said carrier facing the disk to be recorded, said solid immersion lens having refraction face (figure 3, element 104) facing the disk to be recorded; and a focusing lens (figure 2, element 210) installed in said carrier and spaced from said solid immersion lens at an inner side, adapted to focus a laser beam (figure 2, element 204) onto said solid immersion lens, enabling a part of electromagnetic wave to pass through said refraction face and to make a near-field exposure to the disk to be recorded; wherein said solid immersion lens comprises a light scattering layer (see column 4, lines 59-63) plated on said refraction face, which causes a chemical reaction to release silver atoms (column 6, lines 49-61; see also additional notes below) and to enhance electromagnetic wave passing through said refraction face in providing a small optical aperture for the passing of electromagnetic wave when received light energy or heat energy and is reduced to original compound after disappearance of the light energy or heat energy, and a dielectric layer (figure 7B,

element 232) plated on said light scattering layer and adapted to prohibit escaping of gas which is generated during chemical reaction of said light scattering layer.

In regard to claim 4, Mamin discloses that the light scattering layer covers the whole area of said refraction face of said solid immersion lens (see figure 5A, elements 204 & 206; and column 4, lines 65-67).

In regard to claim 5, Mamin discloses that the light scattering layer covers the center area of said refraction face of said solid immersion lens (see figure 5B, element 210; and column 5, lines 3-5).

In regard to claim 6, Mamin discloses that the dielectric layer is made of silicon nitride (see column 6, lines 62-64).

Furthermore in regard to claim 1, it should be noted that Mamin does not explicitly state the phenomenon of silver atoms being released when light or heat energy are received, and the silver atoms being reduced when light or heat energy disappear. However, said phenomenon is well known in the art as described, for example, by Tominaga et al. (hereafter Tominaga ('690)) (US 2002/0067690) (see page 3, paragraph 0031). Therefore, said phenomenon is inherently implied by Mamin.

7. Claims 1, 2, 4-11 rejected under 35 U.S.C. 102(e) as being anticipated by Tominaga et al. (hereafter Tominaga ('745)) (US 6,661,745).

In regard to claim 1, Tominaga ('745) discloses a near-field optical flying head (figure 3a) for near-field recording on a disk, comprising: a carrier (inherently suggested: see additional notes below) maintained in a near-field distance from the surface of the disk to be recorded; a solid immersion lens (figure 3a, element 21) of semispherical

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shape installed in one side of said carrier facing the disk (figure 3a, element 2) to be recorded, said solid immersion lens having refraction face (figure 3a, element 3) facing the disk to be recorded; and a focusing lens (figure 1a, element 1) installed in said carrier and spaced from said solid immersion lens at an inner side, adapted to focus a laser beam (figure 3a, element 11) onto said solid immersion lens, enabling a part of electromagnetic wave to pass through said refraction face and to make a near-field exposure to the disk to be recorded; wherein said solid immersion lens comprises a light scattering layer (column 7, line 23: "plane surface for emitting light") plated on said refraction face, which causes a chemical reaction to release silver atoms (see additional notes below) and to enhance electromagnetic wave passing through said refraction face in providing a small optical aperture for the passing of electromagnetic wave when received light energy or heat energy and is reduced to original compound after disappearance of the light energy or heat energy, and a dielectric layer (column 6, lines 55-65: "protection layer") plated on said light scattering layer and adapted to prohibit escaping of gas which is generated during chemical reaction of said light scattering layer.

In regard to claim 2, Tominaga ('745) discloses that the light scattering layer is made of AgOx (silver oxide) that releases silver atoms when received heat energy (column 8, lines 17-21).

In regard to claim 4, Tominaga ('745) discloses that the light scattering layer covers the whole area of said refraction face of said solid immersion lens (see figure 3a, element 3).

In regard to claim 5, Tominaga ('745) discloses that the light scattering layer covers the center area of said refraction face of said solid immersion lens (see column 6, lines 34-39).

In regard to claims 6 & 11, Tominaga ('745) discloses that the dielectric layer is made of zinc sulfide-silicon dioxide (ZnS--SiO_2) (see column 8, lines 61-63).

In regard to claim 7, Tominaga ('745) discloses a near-field optical flying head (figure 3a) for near-field recording on a disk, comprising: a carrier (inherently suggested: see additional notes below) maintained in a near-field distance from the surface of the disk to be recorded; a solid immersion lens (figure 3a, element 21) of semispherical shape installed in one side of said carrier facing the disk (figure 3a, element 2) to be recorded, said solid immersion lens having refraction face (figure 3a, element 3) facing the disk to be recorded; and a focusing lens (figure 1a, element 1) installed in said carrier and spaced from said solid immersion lens at an inner side, adapted to focus a laser beam (figure 3a, element 11) onto said solid immersion lens, enabling a part of electromagnetic wave to pass through said refraction face and to make a near-field exposure to the disk to be recorded; wherein said solid immersion lens comprises a mask layer (figure 3a, element 3) plated on said refraction face, which is caused to change the refraction index (see column 7, lines 26-37) by heat energy upon transmission of laser beam through said solid immersion lens, providing an optical aperture for the passing of electromagnetic wave, and a dielectric layer (column 6, lines 55-65: "protection layer") plated on said mask layer.

In regard to claim 8, Tominaga ('745) discloses that the mask layer is made of Sb (antimony) (see column 1, line 23).

In regard to claim 9, Tominaga ('745) discloses that the mask layer covers the whole area of said refraction face of said solid immersion lens (see figure 3a, element 3).

In regard to claim 10, Tominaga ('745) discloses that the mask layer covers the center area of said refraction face of said solid immersion lens (see column 6, lines 34-39).

Furthermore in regard to claims 1 & 7, it is well known in the art that an optical head (including a solid immersion lens) is always composed of a carrier (serving as a holder) maintained in a near-field distance from the surface of the disk to be recorded as described, for example, by Mamin (see figure 2, element 100). Therefore, Tominaga ('745) inherently discloses a carrier maintained in a near-field distance from the surface of the disk to be recorded. In regard to claim 1, it should be noted that Tominaga ('745) does not explicitly state the phenomenon of silver atoms being released when light or heat energy are received, and the silver atoms being reduced when light or heat energy disappear. However, said phenomenon is well known in the art as described, for example, by Tominaga ('690) (see page 3, paragraph 0031). Therefore, said phenomenon is inherently implied by Tominaga ('745).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 3 rejected under 35 U.S.C. 103(a) as being unpatentable over Mamin as applied to claim 1 above, and further in view of Reece (US 4,352,872).

For a description of Mamin, see rejection above. Mamin does not disclose that the light scattering layer is made of a silver halide.

Reece in the latent image stabilization of photothermographic emulsion art, discloses that it has been well known in the art to use silver halides for photothermographic imaging materials (see column 1, lines 11-36). Column 1, lines 47-49 disclose that silver atoms are produced upon the exposure of a silver halide to light. It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to have used the silver halide composition of Reece for the light scattering layer of Mamin. The motivation would have been to enable the release of silver atoms to the light scattering layer when the silver halide is exposed to heat or light.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nakano et al. (US 6,498,776) discloses a near field light emitting element (in the form of a solid immersion lens) having first, intermediate and second films shown in figure 2a.

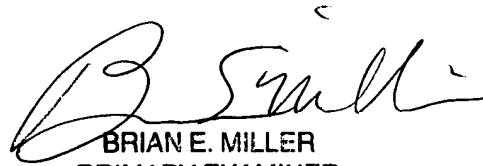
Yee et al. (US 6,535,474) discloses a near field optical recording/reproducing device designed to increase recording density.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Vincent Agustin whose telephone number is (703) 305-8980. The examiner can normally be reached on Monday thru Friday 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3718.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

PVA
01/09/2004



BRIAN E. MILLER
PRIMARY EXAMINER